

滇西北纳西族传统食用植物的民族植物学研究 ——以丽江地区文海村为例*

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摘要: 社会的快速发展加剧了民族传统食用植物及其民族植物学传统知识的流失。粮食危机是全世界一直以来面临的危机, 而在发展中国家则更加严重, 因此开展传统食用植物的民族植物学研究十分重要和迫切。纳西族是滇西北高原上的原著少数民族, 在长期生活过程中积累了丰富的传统植物知识。研究采用民族植物学的原理和方法, 于2012年对坐落于玉龙雪山山麓的文海纳西族村落开展了野外调查, 共访谈信息报告人89人, 其中关键信息报告人30人。具体采用了文献研究方法、参与式调查方法、关键人物访谈法和集体讨论法。结果表明: 纳西族传统食用植物表现出物种数、采集时间、食用部位、食用类型、食用功能5个层面上的多样性。共记录到传统食用植物146种、45科、67属; 与周边玉龙山植物相比, 22%的科和7.4%的属至少有1种食用植物。采集时间可持续全年, 春季采集的食用植物有20.44%, 夏季有22.63%, 秋季有48.18%, 8.76%的食用植物还可在冬季采收。当地食用的植物部位有8种、食用类型有15种, 66种食用植物有药用功能, 可预防和治疗18种疾病。多样化的传统食用植物是纳西族抵抗食物短缺的物质基础, 也蕴藏着丰富的资源。

关键词: 民族植物学; 纳西族; 食用植物多样性

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An Ethnobotanical Study of Traditional Edible Plants Used by Naxi People in Northwest Yunnan, China ——A Case Study in Wenhai Village

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Abstract: Knowledge of edible plants used traditionally by ethnic groups is in danger of being lost in fast changing societies, despite the threat of food shortages worldwide. Thus, it is of major importance to conduct ethnobotanical studies of traditional edible plants as still used. The Naxi people are native to Northwest Yunnan and have accumulated abundant traditional botanical knowledge during their existence as an ethnic group. During the whole of 2012, we conducted an ethnobotanical study of edible plants used by Naxi living in Wenhai Village, located at the foot of Yulong Snow Mountain. The investigation involved a literature research and interviews of 89 informants and 30 key informants. A total of 146 species of edible plants belonging to 48 families and 67 genera were documented as in use. The diversity of edible plants encompassed species diversity, collection time diversity, edible part and consumption

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diversity, and edible function diversity. It was estimated that 22% of plant families and 7.4% of plant genera that comprise the flora of the surrounding area of Yulong Mountain, each contain at least one species of edible plant. Edible plants are collected throughout the year, with 20.44% of them collected in spring, 22.63% in summer, 48.18% in autumn and 8.76% in winter. Traditional edible plants vary according to the part that is edible (eight different types) and consumed (15 types). In addition, 66 edible plants have a medicinal function for preventing or treating 18 different kinds of diseases. The diversity of traditional edible plants used by Naxi people is a rich resource and provides a material basis for avoiding food shortages.

Key words: Ethnobotany; Naxi nationality; Edible plants diversity

The ethnobotany studies of the traditional edible plant are rising in the world. The majority of those studies mainly focused on the investigation and documentation of the traditional edible plants (Ong *et al.*, 2012; Bikarma *et al.*, 2012; Menendez-Baceta *et al.*, 2012; Paul *et al.*, 2011; Tiwari *et al.*, 2010; Ali-Shtayeh *et al.*, 2008). Some other studies concerned about the evaluation and analysis of the traditional edible plant by using quantitative evaluation method such as: Informant Consensus Factor, Cultural Importance Index, Use value, Utilization Frequency and Fidelity level (Gonzalez *et al.*, 2011; Teklehaymanot *et al.*, 2010; Tardio *et al.*, 2008). Also other studies were interested in comparison ethnobotanical research to identify the difference and analyze the integration and evolution process of the traditional edible knowledge between different nationalities and cultural (Jain *et al.*, 2011; Sarma *et al.*, 2010; Victoria *et al.*, 2005). But few studies had engaged in analyzing the diversity of the traditional edible plant and discussing its important role in coping food shortage and keeping a safety food providing system.

The minority areas in China have been experiencing a dramatic change in recent 30 years, this exert huge challenges on the inheritance of the traditional knowledge. At the same time, the biodiversity have been losing fast in the context of globalization, which leads to the even faster loss of the ethnic traditional edible plant knowledge that directly related to it. The previous study indicated that only 51% – 20% of the traditional edible knowledge of wild vegetable can keep remain in the three generations time (Xu and Liu, 2002). It said “The sage Shennong

had tasted hundred herbs and got poisoned 70 times one day”. So long time experience and recognition are the basis of human choice of edible plant. So far, there are not any kind of edible plant which is found directly by scientific research or before folk usage (Pei and Huai, 2007). Obviously, the traditional edible plant resource is the tremendous wealth of our Chinese, but many of them have been disappeared so quickly that even before their value is recognized.

There are 30 000 species of edible plants in the nature world and at least 7 000 of them had been collected or planted for food in one or another times in the human history. However, 90% of the edible plants used by people now are formed by 20 species, and 50% of the human food only provided by three crops: wheat, rice and maize (Lack and Evans, 2001), So it goes without saying that the diversity of the edible plants had lost considerably. The daily food of Chinese is mainly composed by few grains (wheat and rice), and the consumption type are few too (Xiao, 2005). The incidence of many chronic diseases (diabetes, obesity, hypertension, hypercholesterolemia, heart disease, etc.) is surging due to the unbalanced nutrition and poor healthcare function of the diet now. So it is significant to increase the diversity of our plant food and find certain high quality healthcare edible plant, the ethnobotanical study of the traditional edible plant is one of the feasible approach.

In recent years, a series of ethnobotanical study of the traditional edible plant had been carried out in China. Those studies mainly conducted in the southern Yunnan and Inner Mongolia. (Ghorbani *et al.*, 2012; Wujisguleng and Khasbagen, 2010; Huai *et*

al., 2008; Li *et al.*, 2007; Pan *et al.*, 2006; Fang *et al.*, 2006; Khasbagen and Soyolt, 2008; Man *et al.*, 2007; Xu *et al.*, 2004; Liu and Long, 2003; Xu and Liu, 2002; Wang and Long, 1995; Pei and Guo, 1989) The Naxi nationality is an ancient ethnic minority and the related previous researches already indicated that they possess abundant traditional edible botanical knowledge. There are abundant edible botanical knowledge in the famous Dongba Scriptures, besides that, 34 edible medical plants were recorded in the Naxi nationality's ancient medical book "Yulong Materia Medica"; In addition to that, the associated studies conducted in the previous decades also documented many edible plants, 38 traditional edible flowers and 54 traditional edible medical plants used by Naxi nationality had been documented (Pei and Guo, 1989), But by now there is no systematic study of the traditional edible plant used by Naxi nationality in Northwest Yunnan.

1 Study area

The Naxi nationality in China is about 324 679 and mainly inhabits in Yulong Naxi nationality Autonomous County in the Lijiang area (Li, 2001). Their language belongs to the Yi branch of Tibeto-Burman of the Sino-Tibetan Language. The Naxi nationality had been formed during the southward migration of the ancient Qiang People in the Qin Dynasty (221 BC-206 BC) who had inhabited in the Hehuang area of Northwest China (Guo, 1994). A lot of their traditional edible plant and knowledge had been recorded in "Dongba Scriptures" -scriptures of Dongbaism-the Naxi nationality's special religious. The people and culture integration procession in the history of Naxi nationality had also influenced their edible culture in certain extent.

The study were conducted in the Wenhai Naxi Village of Baisha Township, Yulong Naxi Autonomous County of Northwest Yunnan (24–28 N, 98–102 E). Wenhai is a village of like "land of idyllic beauty, rare paradise in the world" and it is the holy land of hikers. The Wenhai villages locates at 26°

59'16.37" E, 100°10'6.23" N. There are 510 people belonging to 107 households and more than 20 people are aged over 80. Weihai Village is a typical ancient Naxi Village. It is called "the first village of the snow mountain" and locates directly on the west foot of the first peak of the Yulong Snow Mountain. Wenhai is a mysterious, quiet and lonely ancient Naxi village locating in the remote Kamiyama of the "Ancient Naxi Kingdom", The Ancient Tea Horse Road past through Wenhai Village on its way to Tibet (Yang, 2009). The Wenhai Village is a plateau basin surrounded by high mountains in four sides and a relatively isolated living environment is formed, Wenhai Lake which known as "the lake green as the turquoise" is in the middle of the plateau. There are subalpine coniferous forest on the sunny slope and mixed coniferous on the shady slope, the surroundings of the lake is meadow.

2 Methodology

The data were collected during the whole year of 2012, at least half month of the ethnobotanical field work was conducted in four seasons to collect the detail information of the entire growing cycle of plant. The method we adopted including literature research, participatory investigation, key informant interview and the group discuss. A total number of 89 informants (49 men and 40 women) were interviewed, their age are ranging from 19 to 83. 35 of them whose even age are all above 60 were interviewed as key informants. During participatory investigation, the work of searching edible plants was done together with the key informant in the field; the aim of the participatory investigation was to do quick inventory, collect voucher specimens as well as record the habitats of the each edible plants. After that the key informant interviews were done to make sure if the plants collected were the right Naxi nationality's traditional edible plant and to add edible plants that had not collected yet. The plant specimen collected in the participatory investigation had been used as a memories clue in the key informant inter-

view. In the key informant interview the detail information of each edible plant like: the Naxi name, habitat and collection time, edible parts, consumption, taste evaluation, amount of resources, health-care function and effect were well documented. In group discussion, the information we had gotten in the first two stages were discussed by a group of informants so that the correctness can be insured, what is more, the further information addition were also done. We collected 3 specimens per each plant. Specimen identification completed with the help of the experts in Kunming Institute of Botany.

3 Results

3.1 Species diversity

The traditional edible plants used by Naxi nationality in Wenhai village are 145 species (109 wild edible plants and 45 cultivated plants) belonged to 45 families and 67 genus. Twenty-five families (56%) and 46 genus (69%) have only one edible plant.

In 1987, Yang Qiner, Li Hen and Wu Zhengyi conducted detail floristic study of Yulongshan Mountain in Lijiang County. Our study was conducted exactly in the same area, so the comparison was made to establish the rate of edible plants in the total floristic of the environment. On the species level, the edible plants take up 5.1% of the floristic in the area, but on the family and genus level, the data

shows that 22% of the family and 7.4% of the genus in the area have at least one species of edible plant (Fig. 1, Fig. 2), so the traditional edible plants come from a wild range of families and genus. The 80% of the botanical food used by people now are those of Gramineae, Rosaceae and Brassicaceae, Comparing with that, the traditional edible plants used by Naxi nationality show high diversity.

According to the traditional knowledge of Naxi nationality, those edible plants are classified into 105 folk taxa. The plants in the same folk taxa have the same Naxi name, play the same edible role and their morphology look similar to each other. Usually, the folk taxa are equivalent to genus. 25 folk taxa have more than 1 species and the top 5 folk taxa have as much as 4 species respectively (Table 1). This implies the genetic diversity of the traditional edible plants. The Naxi nationality's traditional edible plant also shows high family diversity.

3.2 Collection season diversity

Edible plants are collected all year round. Twenty-eight (20.44%) were collected in spring, and 31 species (22.63%) in summer, 66 species (48.18%) in autumn and 12 species (8.76%) of the edible plants which cultivated in home garden can also be collected in the winter (Fig. 3). The home garden is high valued and well-built as a simple greenhouse, plants can be grow in winter as well.

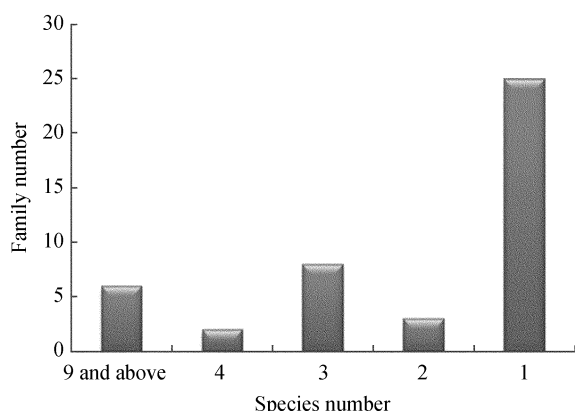


Fig. 1 The family distribution of the traditional Edible plant used by Naxi nationality

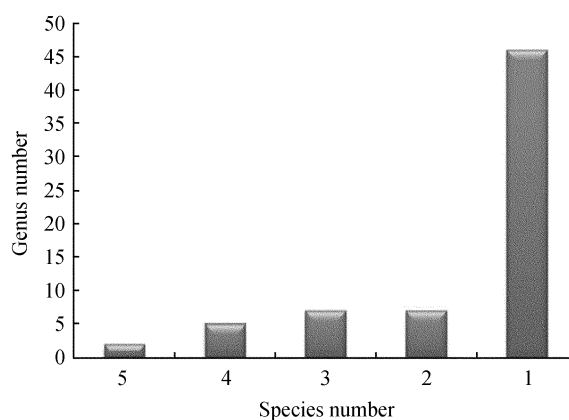


Fig. 2 The genus distribution of the traditional Edible plant used by Naxi nationality

Table 1 The top 5 folk taxa and the species including

Folk taxa (Naxi name)	Species including
a hu	<i>Rubus biflorus</i> ; <i>R. niveus</i> ; <i>R. subornatus</i> ; <i>R. trijugus</i>
men	<i>Fargesia melanostachys</i> ; <i>F. yulongshanensis</i> ; <i>F. communis</i> ; <i>F. yunnanensis</i>
ba qi	<i>Cirsium griseum</i> ; <i>C. lidjiangense</i> ; <i>C. chlorolepis</i> ; <i>C. eriophoroides</i>
shan yao	<i>Dioscorea deltoidea</i> ; <i>D. henryi</i> ; <i>D. hemsleyi</i> ; <i>Dioscorea</i> sp.
lao long pi	<i>Lobaria yunnanensis</i> ; <i>L. orientalis</i> ; <i>L. fuscotomentosa</i> ; <i>Stictis nylanderiana</i>

3.3 Edible parts diversity

The edible parts of Naxi nationality's traditional edible plant have high diversity. Eight types had been used. The most widely used edible parts are fruit (30), leaf (21) and seed (15) (Table 2).

Table 2 Edible parts, plant number and representative plants

Edible part	Number	Representative plants
Fruit	30	<i>Rubus niveus</i>
Leaf	21	<i>Smilacina henryi</i>
Seed	15	<i>Fagopyrum tataricum</i>
Whole aerial parts	12	<i>Ligusticum chuanxiong</i>
Root	9	<i>Lilium lankongense</i>
The whole plant	12	<i>Allium beesianum</i>
Buds	9	<i>Aralia chinensis</i>
Flower	8	<i>Rhododendron yunnanense</i>

Fruit of the wild plants is the mainly used part, leaf of wild and cultivated vegetable is usually the edible part; and when it comes to cultivated grain crops, seed is the used part. Flowers and bugs are always used as snack, roots are mainly used as healthcare food. In the Wenhai village, fruit, leaf and seed are the mainly edible part, their acquisition strategy can be seen a sustainable utilization.

The statistic shows that all plant organs: root, stem, leaf, flower as well as fruit can be used as food by Naxi nationality. Parts of plant in their different growing stage: bugs, tender stems and leaves and so on can all be collected as food in the Naxi village.

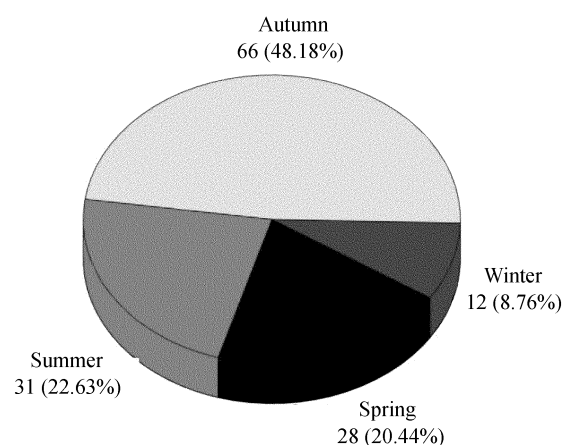


Fig. 3 The collection seasons of the traditional edible plants

3.4 Consumption Diversity

Naxi nationality's traditional consumption of edible plant presents high diversity. According to their eating habit, there are 15 consumption types and the totally consumption is 190 for many plants can be consumed in more than one way. Grain, vegetable and fruit are the main consumption type (Table 3).

The consumption diversity of traditional edible plants provides adequate food and comprehensive nutrition for people, and the more important thing is that it makes daily diet rich and varied. What is more, the consumption diversity of edible plant used by Naxi nationality makes up the strategy: when one kind of consumption is in shortage, other kind of consumption can help to replenish, so the crisis of food shortage can be reduced. Naxi nationality can be used as many consumption types.

26 traditional edible plants have more than one types of consumption, especially their core edible plants such as: turnip, potato and bracken. Turnip is used as grain, vegetable, fruit, and pickle; potato is the major grain and vegetable of Naxi nationality; Bracken is consumed as grain, vegetables, pickles, and brewing too. Those core edible plants adopt the environment very well and have strong capacity of resisting the climate disaster, and always have good yield. Turnip and Potato are the major crops of Naxi nationality, their planted area is the largest and the least harvest amount is over 15 000 kg.

Table 3 Consumption types, plants number and representative plants

Consumption	Number	Representative plants
Vegetables	47	<i>Smilacina henryi</i> ; <i>Capsicum annuum</i> ; <i>Solanum tuberosum</i>
Fruit	43	<i>Rubus niveus</i> ; <i>Malus rockii</i> ; <i>Malus pumila</i>
Health care food	29	<i>Cirsium griseum</i> ; <i>Polygonatum cirrhifolium</i> ; <i>Arctium lappa</i>
Grain	22	<i>Zea mays</i> ; <i>Brassica rapa</i> ; <i>Solanum tuberosum</i>
Seasoning	12	<i>Allium hookeri</i> ; <i>Allium fistulosum</i> ; <i>Coriandrum sativum</i>
Drinks	8	<i>Camellia assamica</i> ; <i>Campylotropis hirtella</i> ; <i>Prinsepia utilis</i>
Snack	6	<i>Rhododendron yunnanense</i> ; <i>Cicer arietinum</i>
Nibble between meals	6	<i>Rosa soulieana</i> ; <i>Berberis liophylla</i> ; <i>Berberis pruinosa</i>
Oilseed	5	<i>Viburnum cylindricum</i> ; <i>Raphanus sativus</i> ; <i>Prinsepia utilis</i>
Brewers	4	<i>Quercus guyavaefolia</i> ; <i>Pteridium revolutum</i>
Fermenting agent	3	<i>Gentiana rigescens</i> ; <i>Gentiana szechenyii</i> ; <i>Gentiana cephalantha</i>
Spices	2	<i>Rosa rugosa</i> ; <i>Origanum vulgare</i>
Sour agent	1	<i>Chaenomeles speciosa</i>
Coagulating agent	1	<i>Cynanchum auriculatum</i>
Bubble gum	1	<i>Scurrula parasitica</i>

Bracken is the major wild edible plant of Naxi nationality, it can be collected in the early spring and the amount is very large. The villagers said that “however the drought is, bracken always can grow up”.

In conclusion, the consumption diversity enables as much plant in the area as food and makes those edible plant resource fully used.

3.5 Function diversity

Except from common edible function, many traditional edible plants have healthcare function and a wild variety of diseases can be prevented or treated through eating them. According to the knowledge of local people, 66 edible plants have healthcare function and 18 types of diseases can be dealt with (Table 4).

The diversity of the traditional healthcare edible plants is very helpful to guarantee the health of people. These diseases that can be dealt by traditional edible plant are including most of common diseases that are easily infected and diseases susceptible to special groups of people like elderly and maternal. For example, the elderly usually consumes pine pollen in the winter to prevent and treat cough and lung disease. Women after delivery needs to take rice wine brewed with *Polygonatum cirrhifolium* root to prevent rheumatism and it is also effective in lactagogue and health restore. People eat fresh root of

Cirsium lidjiangense stewed together with the meat to relieve fatigue. The fresh leaves of *Ligusticum chuanxiong* steamed with eggs is eaten to treat backache caused by excessive physical labor. Insomnia can be relieved by consuming leaves of *Allium tuberosum* in dinner. The function diversity of the traditional edible plants is very helpful to guarantee health of people.

Table 4 Diseases treated by traditional edible plants and the representative plants

Diseases	Number	Representative plants
Cough	11	<i>Pinus yunnanensis</i>
Rheumatism	4	<i>Aconitumstap fianum</i>
Insomnia	3	<i>Schisandra rubriflora</i>
Constipation	1	<i>Chenopodium album</i>
Cold	4	<i>Thamnia Subuliformis</i>
Convulsion in children	1	<i>Prinsepia utilis</i>
Back pain	3	<i>Ligusticum chuanxiong</i>
Bowel cleansing	3	<i>Rhododendron yunnanense</i>
Kidney deficiency	6	<i>Roscoea tibetica</i>
Digestion	5	<i>Raphanus sativus</i> ; <i>Brassica rapa</i>
Postpartum blood stasis	1	<i>Malva verticillata</i>
Heat detoxification	4	<i>Thamnia Vermicularis</i>
Diarrhea	3	<i>Berberis liophylla</i> ; <i>Polygonatum cirrhifolium</i>
Promote lactation	1	<i>Codonopsis convolvulacea</i>
Eye injury	2	<i>Codonopsis convolvulacea</i>
Diuretic	3	<i>Plantago depressa</i>
Fatigue	6	<i>Cirsium lidjiangense</i>
Tonic	5	<i>Saussurea leucoma</i>

4 Discussion and Conclusion

The diversity of the traditional edible plant is the material base of avoiding food shortage. People have a wild resource of food instead of depending on few kinds of edible plants for food. When the production of one plant reduced, they can turn to others, so multiple choices guarantees enough food. Besides that, when one kind of consumption is in shortage, plants of other types can be taken as a supplement, so the diversity of consumption makes people have enough grain, vegetable, fruits and so on. The diversity of the traditional edible plants enables people have adequate and nutrition balanced food.

The food shortage which has been existing in the whole history of human beings is also a serious crisis of the world now. What is more, it has been aggravated in the context of the global climate change. It is predicted that the world grain production will be greatly reduced by the 2080 and the crisis will be more serious in the developing area (Patz *et al.*, 2005; Parrya *et al.*, 2004; Rosenzweig, 1993). A Chinese proverb goes like that: “food is the god”, so how to solve the problem of food shortage is very important to coping global climate change. Since 1999, Northwest China has been suffering from the continuous drought catastrophe. Yunnan province which is suffered more had seen its minimum precipitation since 1961. The continuous drought have led to the constant considerable declination of agricultural production. As the native people Naxi nationality has inhabited on the plateau of Northwest Yunnan for thousands of years, during long time interaction with the environment, they have calculated rich knowledge of coping environmental risks. It is the major capacity of their survival mechanism. The diversity of their traditional edible plants is just a little part of that precious knowledge. It is possible to find a coping strategy of food shortage through the study of the traditional knowledge own by the native people like Naxi nationality.

The diversity of the traditional edible plants used by Naxi nationality also is rich resources. Cer-

tain new crops can be introduced and domesticated from the wild edible plants and the new genetic resources can also be found. At the same time, raw material of health food products could be selected from the abundance healthcare plants. So the traditional edible plants used by Naxi nationality are the important resource that need well protection and further study.

In 1989, Pei Shengji and Guo Huijun made the study of “Preliminary study on edible flowers of North-west Yunnan”, they recorded 38 edible flowers used by Naxi nationality. Compare with Pei's study, this study focused on Naxi nationality and is specialized in their traditional edible plant and knowledge. The other difference from Pei's study is that this study managed to make comprehensive documentation of the traditional edible plants used in the Wenhai Naxi Village and analyzed its diversity. The study is part of a systematic study on the traditional edible plants and knowledge of Naxi nationality and it is also the basis of exploring the adaptive strategy of Naxi nationality to the food shortage.

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